

CLAIMS

What is claimed is:

1. A communication system providing tandem protection in a ring network, the system comprising:

a hub network element having a transceiver transmitting and receiving a signal on said ring network in multiple directions to define a clockwise signal and a counter-clockwise signal and a protection transceiver transmitting and receiving a protection signal on said ring network in a clockwise direction and a counter-clockwise direction;

at least one remote network element in communication with said hub network, said remote network element including a clockwise transceiver and a counter-clockwise transceiver;

said remote network element including a selector for selecting a signal from one of said clockwise transceiver and said counter-clockwise transceiver for transmission to a service interface;

said remote network element including a protection component for transmitting and receiving said protection signal generated by said protection transceiver;

said protection component operating in a loop back mode when said transceiver is operational, said protection component coupling said protection signal to said clockwise transceiver and said counter-clockwise transceiver when said transceiver is not operational.

2. The communication system of claim 1 wherein:

said hub network element includes a hub selector selecting one of said clockwise signal and said counter-clockwise signal for reception at said transceiver.

3. The communication system of claim 1 wherein:

said protection signal has a protection wavelength different than a wavelength of said signal.

4. The communication system of claim 3 wherein:

said protection component includes an optical add-drop multiplexer for selecting said protection wavelength.

5. The communication system of claim 4 wherein:

said optical add-drop multiplexer includes an optical-to-electrical converter and input switch coupled to an input of said clockwise transceiver and to an input of said counter-clockwise transceiver.

6. The communication system of claim 4 wherein:

said optical add-drop multiplexer includes an electrical-to-optical converter and an output switch coupled to an output of said clockwise transceiver and to an output of said counter-clockwise transceiver.

7. The communication system of claim 6 wherein:

said protection component includes a multiplexer disposed between said output of said clockwise transceiver and said output counter-clockwise transceiver and said output switch.

8. A method for providing tandem protection in a ring network, the method comprising:

transmitting and receiving a signal on said ring network in multiple directions to define a clockwise signal and a counter-clockwise signal and transmitting and receiving a protection signal on said ring network in a clockwise direction and a counter-clockwise direction;

at a remote network element, selecting one of said clockwise signal and said counter-clockwise signal for transmission to a service interface;

at said remote network element, transmitting and receiving said protection signal, said protection signal being repeated when one of said clockwise signal and said counter-clockwise signal is present, said protection signal being transmitted to said service interface when said clockwise signal and said counter-clockwise signal are not present.

9. The method of claim 8 wherein:

said protection signal has a protection wavelength different than a wavelength of said clockwise signal and said counter-clockwise signal.

10. The method of claim 8 further comprising:

performing an optical-to-electrical conversion prior to transmitting said protection signal to said service interface.

11. The method of claim 8 further comprising:

receiving a signal from said service interface and transmitting said signal on said protection signal;

performing an electrical-to-optical conversion prior to transmitting said signal on said protection signal.

12. The communication system of claim 11 further comprising:

multiplexing multiple signals from said service interface on said protection signal.